

SU/BOS/IDS / 390

To,

The Principals,

All Concerned Affiliated Colleges / Institutions. Shivaji University, Kolhapur.

Subject: Regarding syllabi of Bachelor Voctional under the Faculty of Inter-Disciplinary Studies.

Sir/Madam,

With reference to the subject, mentioned above,I am directed to inform you that the university authorities have accepted and granted approval to the syllabil of Bachelor Voctional under the Faculty of Inter-Disciplinary Studies.

1)	B.Voc. Horticulture Science and Technology Part - III
2)	B.Voc.Building Technology & Interior Desigh Part - III.
3)	B.Voc. Graphic Desigh Part - III.

This syllabi and equivalence shall be implemented from the academic year 2024-2025 onwards. A soft copy containing the syllabi is attached herewith and it is also available on university website <u>www.unishivaji.ac.in. (Students / Online Syllabus)</u>

The question papers on the pre-revised syllabi of above mentioned course will be set for the examinations to be held in October /November 2024 & March/April 2025. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully, 4.Kubal Dy Registrar)

Date:

Copy to:

1	Director Board of Evaluation and	9	Centre for Distance Education
	Examination		
2	The Dean, Faculty of IDS	10	Computer Centre
3	The Chairman, Respective Board of Studies	11	Affiliation Section (U.G.)
4	B.A.,B.Com., B.Sc. Exam	12	Affiliation Section (P.G.)
5	Eligibility Section	13	P.G.Admission Section
6	O.E. I, II, III, IV Section	14	Appointment Section

SHIVAJI UNIVERSITY, KOLHAPUR



A⁺⁺ Accredited by NAAC (2021) with CGPA 3.52

Faculty of Interdisciplinary Studies

Structure, Scheme and Syllabus for

Bachelor of Vocational (B. Voc.)

Horticulture Science And Technology

Part III- Sem. V &VI

(Subject to the modifications that will be made from time to time)

National Education Policy(NEP-2020) w.e.f. 2024-2025

1. COURSE INFORMATION

Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc./M.voc. courses. These courses will be run by NSQF approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

During the three year duration of 'Horticulture Science And technology' a candidate is trained on professional skill, professional knowledge and Employability skill related to job role. In addition to this a candidate is entrusted to undertake project work, extracurricular activities and on job training to build up confidence. The broad components covered under Professional Skill subject are as below:-

During the three year duration the trainee learns about agro-meteorology, importance of different elements of weather & climate of agriculture, farm power and machinery, types and application of farm power, farm electricity, agricultural implements, basic knowledge on plant biology, Renewable energy, Soil properties, concept of formation of soil moisture and its conservation, role of organic matter in soil and its recycling water and their management, Soil fertility, fertilizers, manures & management of soil fertility and productivity, Introductory horticulture, fundamentals of horticultures, Importance and scope of horticulture, classification of horticultural plants etc. plant tissue culture techniques. The trainee learns about importance of fruits, flowers and vegetables, distribution of area production and productivity of fruits, vegetables and flowers, present situation and scope of development of horticultural crops, schemes on horticultural development, layout of plots and gardens, planning for home gardens, landscape gardens, experimental designs, fruit culture, vegetable propagation, cultivation of fruits& vegetables and its preservation, management of orchards, present situation of cultivation of different fruits, Vegetative propagation, different methods of vegetative propagation of fruits and flowers. cultivation of vegetables & spices, present situation in the cultivation of different vegetable crops, cultivation of flowers, climbers, foliages & other crops, cultivation of mushroom, care and management of potted plants, pest management, classes of insect pests diseases, integrated pest management, Seed production, marketing & trade management, quality of seeds and classification of seeds, Inventory control & maintenance of records, markets and marketing, trade and trading, methods of management of store, types of market, export of products etc.

2. Training scheme

The (NSQF) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of NSQF. Horticulture Science and Technology with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of NSQF for strengthening vocational training.

'Horticulture Science and Technology' is one of the popular courses delivered nationwide through network of NSQF. The course is of three years duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skills) imparts requisite core skill & knowledge and life skills. After passing out the training program at every level the trainee is awarded by Certificate given by college and university which is recognized worldwide.

Candidates require broadly demonstrating that they are competent to:

1. Read and interpret technical parameters/ documents, plan and organize work processes, identify

necessary materials and tools;

- 2. Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations; Apply professional skill, knowledge & employability skills while performing jobs.
- 3. Document the technical parameters related to the task undertaken.

2.1 Development pathways

- 1.Can join as Horticultural consultants, Horticultural technician, Plant Care Worker, Nursery Staffer, Pest Management, Horticultural Inspector, Gardener, General, Nurseryman, Planter.
- 2. Can become Entrepreneur in the related field.
- 3. Can join Apprenticeship program me in different types of industries leading to National Apprenticeship certificate(NAC).
- 4. Can join Master Degree (Vocational) courses under NSQF as applicable.

3. LEARNING OUTCOME

Learning outcomes are a expression of total competencies of a learner and assessment will be carried out as per the assessment criteria.

LEARNING OUTCOMES (TRADE SPECIFIC)

1. Recognize metrological instruments and the miscellany within the vocation of horticulture subsequent safety

precautions.

- 2. Preparation and organize life cycles of plants, scope of horticulture and introduction to fruits, flowers & vegetables.
- 3. Categorize fruits and vegetables based on season and edible parts.
- 4. Set up agro-meteorology instruments, scrutinize metrological information and documente the data.
- 5. Classify, select and maintain different farm power machinery.
- 6. Evaluate physical and chemical properties of soil, soil pH, different methods and ingredient use for correction of Acid soil.
- 7. Arrange, install and use different irrigation systems, Water lifting systems and water quality Assessment systems.
- 8. Identify diverse types of soil, methods of soil sampling and collection, study on soil physical characters, know soil test reports and different soil correction methods.
- 9. Study soil water holding capacity, Different methods and ingredients used for correction of Saline soil. Field visit for identification of soil troubles.
- 10. Plan and implement different soil correction method through drainage and agronomic practices.
- 11. Determine soil fertility and apply soil fertility management for enhancement of fertility of soil.
- 12. To concern Integrated Nutrient Management System (INMS) in the field.

- 13. Identify, set up and apply Bio-fertilizers.
- 14. Recognize the role of major and minor plant nutrients and its deficiency symptoms.
- 15. Produce special types of fruits, vegetables and flowers as per the requirements.
- 16. Use appropriate various cultivation techniques & methods to fruit crops & vegetable farms.
- 17. Preparation and implement different garden layouts and designs.
- 18. Identify and select different Vegetative propagation method & utilization of plant hormones.
- 19. Apply propagation techniques viz cutting, grafting, budding and layering.
- 20.Process and preserve vegetables and fruits using different techniques to prepare jam, jelly, squash, sauce, pickle, ketchup etc. its preservation and storage.
- 21. Develop the Cultivation techniques of different vegetables and spice crops.
- 22. Perform Floriculture and cultivation techniques for different Flowers, Climbers, Foliages and Medicinal plants to decorate.
- 23. Perform Cultivation of wild seasonal herbaceous flowering plants, wild tuberous plants, Betel Vine and Mushroom farming.
- 24. Apply Pest Management and control the Pest and Diseases of Horticultural Crops.
- 25. Use techniques of Seed Production, Processing and Packaging.
- 26. Maintain the records viz. Inventory Control, Maintenance of Records and Store management.
- 27. Conduct Market Survey and follow the legal requirement for trading as part of entrepreneurship development.
- 28. Develop the tissue culture techniques of different wild ornamental edible fruit and aromatic and medicinal plants.

JOB ROLE

Gardener, General; (Mali General) grows flowers, trees, shrubs, seedlings, vegetables, etc. in public or private gardens. Prepares soil and sows seeds, plants, seedlings etc. Waters seed-beds and growing plants. Weeds and hoes garden and prunes hedges and bushes. Sprays and dusts pesticides and evolves other measures to protect plants from diseases and wild animals. Prepares soil and lays lawn. Waters mows and levels lawns. Prepares paths and ensures their proper up-keep. Collects and preserves seeds for sowing. Supervises labourers engaged for assistance. Keeps implements etc. in good working order. May maintain green house for display. May cultivate vegetables and fruit trees. May specialize in ornamental gardening. May work in nursery for improving variety of plants from seeds, cuttings, grafting or budding and be designated as MALI, NURSERY. May sell plants, buy seeds, fertilizers, insecticides, etc. May pay wages to labourers employed.

Nurseryman; Mali, Nursery manages nursery on own account, or on behalf of employer to grow trees, plants, flowers, shrubs, creepers, seeds, bulbs etc. in open air or green houses for sale to customers. Decides kind and number of plants to be grown and method of planting, cultivating and treatment based on soil, climatic conditions, irrigation facilities etc. Selects and purchases seeds, fertilizers, insecticide. Equipment and machinery and other items. Plans preparation of beds and method of planting, depending on type of plants to be grown. Prepares bed by various processes such as breaking soil, mixing fertilizers, etc. sows seeds, plants, seedlings, cuttings or propagates plants by grafting, budding and other methods and makes water channels. Watches growth of sapling, seedlings, grafts and plants. Hoes and prunes excess growth and off-shoots of plants, dusts and sprays pesticides and takes other measures to protect plants from pets, wild animals, etc. Observes development of plants. Develops methods of grafting and budding./ Collects and preserves seeds for sale. Hires labour if necessary and undertakes planting, weeding, pruning etc. as

required. Supervises their work and trains them. Maintains buildings and equipment in good condition. Keeps records of cost and production statement. Sells seedling, seeds, bulbs etc. May specialize in landscape planting.

Planter; manages plantation on own account to grow plantation crops such as tea, coffee, rubber, etc. Arranges to procure seed according to type of crop such as tea, coffee, rubber, etc. Determines kinds of crop to be grown. Gets land cleared and prepared for growing crops by digging, ploughing, harrowing etc. Organizes and supervises various farm operations, sowing, manuring, weeding, spraying insecticide, and protection of crop from destruction by wild animals. Arranges harvesting of crop and supervises plucking, tapping and threshing of leaves, etc. Ensures proper maintenance and development of plantation estate. Maintains records relating to cost of production, sale and other accounts. May conduct research and organize demonstration. May arrange preservation of produce and partially process them prior to marketing. Is designated as Planter, Tea; Planter, Coffee; Planter, Cinchona; Planter, Cocoa; Planter, Rubber according to type of crop grown.

Key Features: Objectives

i)To provide judicious mix of skills relating to a profession and appropriate content of General Education.

- ii) To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- iii) To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- iv) To integrate NSQF within the undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- v) To provide vertical mobility to students admitted in such vocational courses.

The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Industrial Tool Manufacturing and will be offered by respective affiliating University.

Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X II	Corresponding NSQF level
Certificate	Sixth month	5
Diploma	1 Year	6
Advance Diploma	2 Year	7
B.Voc. Degree	3 Year	8

Course Structure

The course will consist of combination of practice, theory and hands on skills in the Capital Goods Sector. **Curriculum**

The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components.

Skill Development Components:

The focus of skill development components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill development components will be relevant to the industry as per its requirements.

The curriculum will necessarily embed within itself, National Occupational Standards (NOSs) of specific job roles within the industry. This would enable the students to meet the learning outcomes specified in the NOSs.

The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains.

The curriculum will focus on work-readiness skills in each of the year of training.

Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work. Industrial Tool Manufacturing

A] Ordinance and Regulations: (As applicable to Degree vocational Course)

B] Shivaji University, Kolhapur

Syllabus For Bachelor vocational course in Horticulture Science and technology

1. TITLE: Subject- Horticulture Science and technology

Under the Faculty of interdisciplinary studies

2. YEAR OF IMPLEMENTATION: - Syllabi will be implemented from June 2020onwards.

3. PREAMBLE:-

[Note :- The Adhoc Board of Studies should briefly mention foundation, core and applied components of the course/paper. The student should get into the prime objectives and expected level of study with required outcome in terms of basic and advance knowledge at examination level.] **B** Voc Part I II and III (Three Years)

4. DURATION

	B. Voc. Part I - Diploma (One Year)
	B. Voc. Part II - Advanced Diploma (Second Year)
	B. Voc. Part III- Degree (Third Year)
5.STRUCTURE OF COURSE :	B. Voc. Part – I, II and III
	Two Semester Per Year
	One general Papers per year / semester
	One elective course paper per semester
	Three Core course papers /Vocational Papers per semester
	Five Practical papers per semester
	One Project / Industry Visit/ Study Tour / Survey/Internship/Hands
	on training.
7. INTAKE CAPACITY :	50 Students

6. SCHEME OF EXAMINATION

Evaluation System: The evaluation system will be the same as followed by the Shivaji University, Kolhapur. This course is consists of a six semester and shall have a weight age for Internal Exams and for term end exams. The achieved marks and percentage shall be conversion as determined below.

Grades and Grade Points

Letter Grade	Grade Points
O (Outstanding)	10
A+ (Excellence)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)	0
Ab (Absent)	0

Theory Examination- Attends of semester as per Shivaji University rules.

A) THEORY

The theory examination shall be at the end of the each semester. All the general theory shall carry 50marks, elective and vocational theory papers shall carry 50marks. Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above. The question paper will be set in the view of entire syllabus preferably covering each unit of the syllabus.

Nature of question paper for Theory examination (Excluding Business Communication Paper)– Multiple choice (08)

lultiple choice (08)	08 mks
Long answer type (any two) out of three	16 mks
Write short notes (any four) out of six	16 mks
Internal evaluation	10mks

B) PRACTICAL

Each semester there will be external practical examination attendant of semester. Evaluation of the performance of the students in practical shall be on the basis of semester examination. Each paper having separate practical (EC/CC) 50 mks

C) Project /field visit/ internship/fieldwork/Hands on training.

Standard of Passing:

As per the guidelines and rules for B. Voc. (Attached Separately - Annexure I)

7. FEE STRUCTURE:

As per Government/University rules.

1. Refer website of concern affiliated college/institute to Shivaji University, Kolhapur.

2. Other fee will be applicable as per rules and norms of UGC and Shivaji University, Kolhapur.

8. ELIGIBILITY FOR ADMISSION:

As per guidelines obtained from UGC, NSQF and Shivaji University, Kolhapur by following rules and regarding reservations by Govt. of Maharashtra.

9. MEDIUM OF INSTRUCTION:

The medium of instruction shall be in English.

10. STRUCTURE OF COURSE- B. Voc. Horticulture Science and Technology.

11. Eligibility for Admission : 10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream.

12. Eligibility for Faculty : 1) M. Sc. (Horticulture/Botany) with NET / SET/ Ph.D.

2) M.A. (English) with NET/SET Ph.D. for Communication skill.

13. Eligibility for Laboratory Assistant cum clerk: B.Sc. (Horticulture/Botany) with MSCIT

14. Eligibility for Laboratory attendant cum gardener: Diploma in Agriculture/B.Sc. in Botany.

15.Staffing Pattern:

Teaching:

In1st Year of B. Voc.1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business communication. In 2ndYearof B. Voc. Total requirement of faculty (Inclusive of 1stYear) will be 3 Full time and 1CHB Lecturer for Financial Accounting1 CHB, Lecturer for Business Communication.n3rdYearof B. Voc.–Total requirement of faculty (Inclusiveof1st&2ndYear) will be 4 Full time and 1 part time and 1 CHB Lecturer for Business Communication.

National Education Policy(NEP-2020)_

Third Year Bachelor of Vocation (B. Voc.- Degree)Course Structure for (Level-7)

With Multiple Entry and Multiple Exit option

(To be implemented from the Academic Year 2024-25)

		Semester V – Duration: 6 Months										
		Teaching Scheme							Evalu	nation Se	cher	ne
Sr. No.	Course no.	Course	No. Lectu	of ires	Hours (T +	Cred its	Theor y	Intern al/	Total Marks	Min Marks (Separat e	Exa Dur or (Hr	um ati n s.)
			Т	Р	P)			Practi cal		passing)	Т	Р
1.	BVHSTCS121	Communication skills and personality development -III	4	-	6	4	40	10	50	18	2	-
2.	BVHSTEC122	Fruit And vegetable processing	4	2	6	4	40	10	50	18	2	-
3.	BVHSTCC 123	Green house technology	4	-	4	4	50	-	50	18	2	-
4.	BVHSTCC 124	Landscape Architecture	4	-	4	4	50	-	50	18	2	-
5.	BVHSTCC 125	Nutrition of Horticultural Cropsand its Management	4	-	4	4	50	-	50	18	2	-
6.	BVHSTEC122	SEC-E-I	-	4	4	2	-	50	50	18	-	3
7.	BVHSTCC 123	SEC-E-II	-	4	4	2	-	50	50	18	-	3
8.	BVHSTCC 124	SEC-E-III	-	4	4	2	-	50	50	18	-	3
9.	BVHSTCC 125	SEC-E-IV	-	-	2	2	-	50	50	18	-	-
		Total	20	14	36	28	230	220	450	-		

		Semester VI – Duration: 6 Months										
		Teaching Scheme							Evalı	ation S	Scher	ne
Sr.	Course no.	Course	No. Lectu	of res	Hours $(T + P)$	Cred its	Theor y	Internal / Practic al	Total Marks	Min Marks (Separa	Exan Dura n(Hr	m tio s.)
110.			Т	Р	(1 - 1)					te Passing	Т	Р
1.	BVHSTCS126	Hortipreneurship developmentand Business Management-VI	4	-	6	4	40	10	50	18	2	-
2.	BVHSTEC127	Post harvesting management of Horticulture product	4	2	6	4	40	10	50	18	2	-
3.	BVHSTCC 128	Food Beverages	4	-	4	4	50	-	50	18	2	-
4.	BVHSTCC 129	Processing of Horticulture Product	4	-	4	4	50	-	50	18	2	-
5.	BVHSTCC 130	Fundamentals of Entomology ,pest of fruit vegetable andflower	4	-	4	4	50	-	50	18	2	-
6.	BVHSTEC127	SEC-E-I	-	4	4	2	-	50	50	18	-	3
7.	BVHSTCC 128	SEC-E-II	-	4	4	2	-	50	50	18	-	3
8.	BVHSTCC 129	SEC-E-III	-	4	4	2	-	50	50	18	-	3
9.	BVHSTCC 130	SEC-E-IV	-	-	2	2	-	50	50	18	-	-
		Total	20	14	36	28	230	220	450	-	-	

• Student Contact Hrs Per week: 36 hrs	• Total marks for B.Voc Degree: 900
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• Theory and Practical Lectures: 48 Minutes Each

• Total credits for B.Voc.- Degree: 56

• AECC: Ability Enhancement Compulsory Course (Compulsory English)

• Practical workload will for batch of 20 students

• Practical Examination will be conducted Semester wise for 50 Marks per course (subject).

- DSC: Discipline Specific Core Course Candidate can opt three courses (Subjects) from DSC.
- GEC: Generic Elective Compulsory Course Candidate can opt any one course (Subject).
- There shall be separate passing for theory and practical courses.
- AECC & GEC Internal Evaluation should be done at college or respective departmental level
- SEC-E & SEC-F are two parts of Vocational Degree Course

*BVHSTCS: Bachelor of Vocational Horticulture Science And Technology Communication Skill. *BVHSTEC: Bachelor of Vocational Horticulture Science And Technology Elective Course. *BVHSTCC: Bachelor of Vocational Horticulture Science And Technology Core course. * T: Theory

* P: Practical** Non credit courses must be completed as per guidelines of Shivaji University, Kolhapur.

Bachelor of Vocation (B. Voc.) Part III - Sem. V (AECC-ED)

Paper – I: Communication skills and personality development –III Course no. BVHSTCS121

Paper No: BVHSTCS121		Credits: 04
Theory: 4 lectures/week	Total Marks: 50 (Theory 40 -	+ Internal 10)
Units Prescribed for Theory: 40 Marks.		
1. To develop the knowledge about basi	cs of Personality	
2. To develop the knowledge about Lead	lership	
3. To develop the knowledge about inter	personal Communication and Relation	ship
4. To develop organization skill, manageri	al skills and problem solving skills.	Ι
5 To develop communication skills for ma	arketing products	
Module I:		5
Definition and Basics of Personality.		
Analyzing Strength and Weakness.		
Personality Development : Concept and Process.		
Module II:		8
Body Language – Meaning, Definition, Use of body language	- Gesture, Posture, Eye contact,	-
Facial expression		
Preparation of Self -Introduction.		
Communication Skills: Listening, writing, speaking skills		
Communication Barriers; Overcoming these barriers.		
Module III:		8
Building Self-Esteem and Self- Confidence.		
Attitudes: Meaning, Types - Assertive, Aggressive and Subm Introduction to Leadership; Leadership Styles; Group Dynam	issive; Positive, Negative, Neutral ics.	
Module IV: Interview Technique		9
Team Building : Meaning, Steps		
Interpersonal Communication and Relationship; Use of ver	bal and non verbal communication.	
Conflict Management: Introduction, Levels of Conflict and	Managing Conflict.	
Time Management: Concept, Importance and Need, Steps t	owards better Time Management.	
Public Speaking: Introduction, Increasing Vocabulary, Void	ce Modulation, Social Graces	
Email and Telephone Etiquettes		
Practicals Based on theory	3	51
Reference Books:		
1. Balasubrmanyam M. 1985. Business Communication. Vani Education	onal Books, New Delhi.	
2. Naterop, Jean, B. and Rod Revell. 1997. Telephoning in English. Ca	mbridge University Press,	
Cambridge.		
3. Mohan Krishna and Meera Banerjee. 1990. Developing Communica	tion Skills. Macmillan India Ltd.	
New Delhi.		
4. Krishnaswamy, N and Sriraman, T. 1995. Current English for Colle	ges. Macmillan India Ltd. Madras.	
5. Narayanaswamy V R. 1979. Strengthen your writing. Orient Longm	an, New Delhi.	
6. Sharma R C and Krishna Mohan. 1978. Business Correspondence. T	Tata Mc Graw Hill publishing	
Company, New Delhi.		
7. Carnegie, Dale. 2012. How to Win Friends and Influence People in the Company of the December 2012.	the Digital Age. Simon & Schuster	
8. Covey Stephen R. 1989. The Seven Habits of Highly Successful Peop	ple. Free Press.	
9. Spitzberg B, Barge K & Morreale, Sherwyn P. 2006. <i>Human Comm</i> <i>Skills</i> . Wadsworth.	unication: Motivation,Knowledge &	

Bachelor of Vocation (B. Voc.) Part III - Sem. V Generic Elective Compulsory Course (GEC–E) Paper Title: Fruit And Vegetable Processing					
Paper No: Theory: 4 lectures/week Practical: 2 lectures/week/	Course no. BVHSTEC127	Credits: 04 Total Marks: 50 (Theory 40 + Internal 10)			
Course Outcomes: The stud	lents will acquire knowledge of				
 Acquire the knowl Acquire the knowle Acquire the knowle 	edge about fruit and vegetable pro edge about preservative techniques. edge about Govt. policy on import	and export ofprocessed fruits.			
Module I Importance and sco Food pipeli Unit operation	pe of fruit and vegetable preserva ne, losses in post-harvest operation ion in food processing.	15 tion industry in India. ns.			
Module II		15			
Principles and guide Principles a Methods of p	elines for the location of processing nd methods of preservation by hea preparation of juice, squash, syrup,	g units. t pasteurization, canning and Bottling. , wine, neera, Jam and jelly.			
Module III		14			
Preservation by suga Preservation Preparation and press	ar and chemicals; candies and crys with salt and vinegar. ervation of Pickles, chutneys, sauce	tallized fruits s, tomato and mushrooms.			
Module IV		16			
Processing of plant Spoilage in I Govt. policy	ation crop products e.g Custard ap processed foods, quality control of on import and export of processed	ple, Grape and Pomegranate. processed products. l fruits. Food laws.			
References:					
1.Bhatti, S. 1995.V 2.Chadha, K. L. 20 3.Chadha, K. L. an 4.DauthyandMircea Lucknow.	ame, Fruit and vegetable processing. 03. Hand book of horticulture, ICA d Kalloo, G.1993. Advances in Hor a,E.1995. Fruitandvegetablesprocessin	CBS Publishers, Distributors,NewDelhi. R, New Delhi. ticulture. Vol. 4 to 10. MPH, New Delhi ng.International Book DistributionCo,			
5.Dauthy, M. E. 19 Book Distributing	995. Fruits and Vegetables Processing Co., Lucknow.	ng- FAO Bulletin 119. International			
6.FAO - Training Vegetables and Ro Processing Techn	Manual No.1//2. 2007. Prevention of ot crops. Daya Publishing House, De ology – principles and Practices. Ell	or post-harvest food losses: Fruits, lhi.Fellows, P. J. 1998. Food isHorwood.			
e-reading: http://	ecourses.iasri.res.in/				
http://www.fao.o	rg/infoods/index_en.stm				
	11				

Bachelor of Vocation (B. Voc.) Part III - Sem. V Discipline Specific Core Course (DSC– E-I) Paper Title: Green House Technology Course no. BVHSTCC123

Paper No:	Credits: 04
Theory: 4 lectures/week	Total Marks: 50 (Theory)
Theory: 4 lectures/week	I otal Marks: 50 (1 he

Course Outcomes: The students will acquire knowledge of

- 1. Acquire the knowledge about green house management.
- 2. Acquire the knowledge about various operations carried out ingreen house.
- 3. Acquire the knowledge about cost estimation and economicanalysis.

Module I

15

Precision farming – laser levelling, mechanized direct seed sowing, seedling and sapling Transplantation.

Mapping of soils and plant attributes ,site specific input application.

Management of weeds, insect pests and diseases; yield mapping in horticultural crops. le II 15

Module II

Green house technology: Introduction Importance, scope, advantages and dis-advantages Types of Green Houses; design of greenhouses.

Greenhouse cooling and heating.

Module III

14

Green house equipment, materials for construction of traditional and low cost green houses. Irrigation systems used in greenhouses, Typical applications, passive solar green house,hot air greenhouse heating systems, green house drying. Cost benefit analysis.

Module IV

16

Choice of crops for cultivation under greenhouses, problems / constraints of green house cultivation and future strategies.

Growing media, soil culture, type of soil required, drainage, flooding and leaching. Post production management of green house product(flower)

Course outcome:

References:

- 1. Aldrich R A and Bartok J W. 1994. NRAES, Riley, Robb Hall. Green House Engineering.Cornell University, Ithaca, New York.
- 2. Balraj Singh. 2006. Protected cultivation of vegetable crops. Kalyani Publishers, Ludhiana.
- 3. Brahma Singh, 2014. Advances in Protected Cultivation. New India Publishing Agency. NewDelhi.
- 4. Jitendra Singh, 2015.Precision Farming in Horticulture. New India Publishing Agency. NewDelhi.
- 5. Jitendra Singh, S.K. Jain, L.K. Dashora, B.S. Cundawat.2013. Precision forming in
- 6. Horticulture. New India Publishing Agency, New Delhi.
- 7. Pant V Nelson. 1991. Green House Operation and Management. Bali Publication.
- 8. Prasad S. 2005. Greenhouse Management for Horticultural Crops. Agrobios. Jodhpur.
- 9. Reddy P. Parvatha, 2003. Protected Cultivation. Springer Publications. USA. *e-reading:* http://ecourses.iasri.res.in/

Bachelor of Vocation (B. Voc.) Part III - Sem. V Discipline Specific Core Course (DSC– E-II) Paper Title: Landscape Architecture Course no. BVHSTCC124

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Paper No: Theory: 4 lectures/week	Credits: 04 Total Marks: 50 (Theory)
Course Outcomes: The students will acquire knowledge of	
1. Acquire the knowledge about green house management.	
2. Acquire the knowledge about various operations carried	out in greenhouse.
3. Acquire the knowledge about the cost estimation and eco	onomicanalysis
Module I	15
History, definitions and industrial importance of ornamental	plants and flowers.
Importance, classification, design values and general cultivati	ion aspects for ornamental plants viz.
Annuals, biennales herbaceous perennials, grasses and bulbo	ous ornamentals.
Importance, classification, design values and general cultivati	on aspects for ornamental plants viz.
shrubs, climbers, trees, indoor plants, palms and cycads, fern	ns, cacti and succulents.
Module II	15
Importance, design and establishment of garden features/com	ponents viz. hedge, edge, borders,
Inower beds, bridges, paths, drives, fences, garden walls, gate	es, carpet bed, arbour.
walls shade garden sunken garden roof garden terrace gard	den pebble garden rockery
Importance design and establishment of garden features/com	nonents viz Pools waterfalls
mountains, bog garden, avenue planting and children garden	
Module III	14
Lawn types, establishment and maintenance	
Importance of Garden adornments viz. floral clock, bird bath	, statutes, sculptures.
Importance of Garden adornments viz.lanterns, water basins,	, garden benches .
Module IV	16
Importance of flower arrangement, Ikebana, techniques, type	es, suitable flowers and cut Foliage.
Public parks and Botanical gardens.	
Uses of vertical garden, bottle garden, terrariums and mainter	nance.
1 Arora IS 2006 Introductory Ornamontal Horticultura K	alvani Dublishara Ludhiana
2 Bimaldas Chowdhury and Balai Lal Jana 2014 Elowering	Garden trees Pointer publishers
Lainur India	Garden trees. I onter publishers,
2 Dece Chevydhywy and Sharma 1001 Tranical Cardan Dlan	to in colour, Horticulture and allied
5. Dose, Chowanary and Sharma. 1991. Hopical Garden Plan publishers 3D Madhab Chatteries street Kolkata	is in colour .Hornculture and amed
A Bose TK Mukheriee D 2004 Gardening in India Oxfor	rd & IBH Publishers
5 Chadha K L and Chaudhary B 1986 Ornamental Hortic	ulture in India Publication
AndInformationdivision ICAR New Delhi	
6. K.V.Peter 2009. Ornamental plants. New India publishing	agency, Pitampura, New Delhi,
7. Randhawa, G.S. AmitabhaMukhopadhyay, 2004. Floricult	ture in India. Allied Publishers Pvt.
Ltd., New Delhi.	
8. Richard Bird. 2002. Flowering trees and shrubs. Printed in	a Singapore by Star Standard
Industries pvt. Ltd.	•

e-reading: http://ecourses.iasri.res.in/

Bachelor of Vocation (B. Voc.) Part II - Sem. V Discipline Specific Core Course (DSC– E-III) Paper Title: Nutrition of Horticultural Crops and its Management Course no. BVHSTCC125

Paper No: Theory: 4 lectures/week	Credits: 04 Total Marks: 50 (Theory)
Course Outcomes: The students will acquire knowledge of	
1. Acquire the knowledge of Preparation of various fertilizers.	
2. Acquire the knowledge of processing of fertilizers.	
3. Acquire the knowledge of Secondary and micronutrient ferti	ilizers.
Module I	15
Introduction, definition – difference between manures and fertilizers – classif	fication of manures
with suitable examples -importance of manures in Soil fertility management.	
Compost and composting-different methods of composting including th	ne starters and raw
meterials, methods of preparations of rural and urban compost. Mechanical co	ompost plants-Vermi
composting .Bulky organic manures-Preparation of FYM – Methods of co	ollection and storage
Lossesof nutrients from FYM during collection ,storage and ways to minimiz	these losses .
Module II	15
Commercial fertilizers: Nitrogenous fertilizers – Manufacturing process and	nd properties ofnitrogenious
fertilizers viz, Ammonia, Ammonium sulphate.	
Manufacturing process and properties of nitrogenous fertilizers viz. Urea a	nd calcium
ammonium nitrate . Slow releasing N Fertilizers .	
Potassic fertilizers – Mineral sources - Manufacturing process and properti	es of Muriateof
potash and sulphate of potash – mode of action of N, P and K fertilizers in	soil.
Phospatic fertilizers -Rock phosphate-uses –occurrences, types and propert	ties.
Module III	15
Granulation, unit value, grade and ratio of fertilizers. Computation of fert	tilizers mixture
Combined application of fertilizers and Agricultural chemicals, Precaution	ns and Compatibility.
Fertilizer and efficiency-soil, plant, and fertilizer and management factors	influencing
FUE –Measures to improve the use of N,P and K fertilizers.	
Biofertilizers – Methods of preparations and uses in Horticulture.	15
Module IV	15
Secondary and micronutrient fertilizers – Conditions leading to their defici-	ency importanceol
Compound and Complex fortilizers used in India MAL DAD, HAD, ADS	S III SOIIS.
NDK complexes manufacturing process and properties	Nitro phosphatesand
Mixed and bulk blanded fartilizers. Dry and wet process of mixing advan	tages and
disadvantages of mixed fortilizers over straight fortilizers. Divide and che	migel problemsin
their preparation	ennear problemsni
Beforences:	
1 Vawalkar K S Agarwal IP and Bokda S 1077 Manures and Fartilizer /	Agri Horticultural
Publishing House Nagapur	Agn-norticultural
2 Seothayanam S Biswas BC Maheswari S and Yaday DS 1986 – Han	d Book on Fertilizers
Technology – The Fertilizers Association of India New Delhi	
3. Tisdale, S.L. Nelson, W.L. and Beaton J.D. 1993 Soil Fertilizer and Fertili	zers – Mac
Millan Publising Co New York	2015 11100
4. e-reading: http://ecourses.jasri.res.in/	

Bachelor of Vocation (B. Voc.) Part III - Sem. V Skill Enhancement Courses (SEC– E-I) Paper Title: Fruit And Vegetable processing Practical: I Course no. BVHSTEC122

Paper No:		
Practical: 4 lectures/week		

Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Acquire the knowledge about fruit and vegetable processing.
- 2. Acquire the knowledge about preservative techniques.
- 3.Acquire the knowledge about Govt. policy on import and export of processed fruits.

- 1. Equipment's used in food processing units
- 2. Types of containers used for processing of fruits and vegetables.
- 3. Dehydration of fruits and vegetables.
- 4. Canning of fruits- mango, pineapple, guava.
- 5. Canning of vegetables- peas, tomato.
- 6. Processing of plantation of oil crops.
- 7. Preparation of squash and syrup.
- 8. Spoilage of processed products.
- 9. Preparation of jam and jelly.
- 10. Preparation of candies and tomato ketchup.
- 11. Preparation of chutneys.
- 12. Preparation of hot pickles and sweet pickles.
- 13. Refrigeration and freezing.
- 14. Project/Field visit/ Internship/ Field work /Hands on training

Bachelor of Vocation (B. Voc.) Part III - Sem. V Skill Enhancement Courses (SEC– E-II) Paper Title: Green House Technology Practical: II Course no. BVHSTCC123

Paper No:.	
Practical: 4 lectures/week	

Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Acquire the knowledge about green house management.
- 2. Acquire the knowledge about various operations carried out ingreen house.
- 3. Acquire the knowledge about cost estimation and economicanalysis.

- 1. Study of different types of greenhouses based on shape, utility, construction and cladding materials.
- 2. Calculation of air rate exchange in an active summer winter cooling system.
- 3. Estimation of drying rate of agricultural products inside green house.
- 4. Testing of soil and water to study its suitability for growing crops in greenhouses.
- 5. The study of fertigation requirements for greenhouses crops and estimation of E.C. in the fertigation solution.
- 6-7. The study of various growing media used in raising of greenhouse crops and their preparation and pasteurization sterilization.
- 8. Cultivation of solanaceous crops under protected cultivation (Capsicum, Tomato)
- 9. Cultivation of Cucurbits under protected cultivation with mulches.
- 10. Cultivation of Summer squash under protected cultivation with mulches.
- 11. Cultivation of melons and beans under protected cultivation with mulches.
- 12. Cultivation of spinach, coriander.
- 13. Visit to commercial greenhouses.

Bachelor of Vocation (B. Voc.) Part III - Sem. V Skill Enhancement Courses (SEC– E-III) Paper Title: Landscape Architecture Practical III Course no. BVHSTCC124

Paper No:	Credits: 02
Practical: 4 lectures/week	Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

- 1. Acquire the knowledge about green house management.
- 2. Acquire the knowledge about various operations carried out in greenhouse.
- 3. Acquire the knowledge about the cost estimation and economicanalysis

- 1. Study of garden equipments
- 2. Identification and description of annuals, herbaceous, perennials.
- 3. Identification and description of trees, palms, ferns.
- 4. Identification and description of hedges and edges.
- 5. Planning and designing virtual garden
- 6. Use of drawing equipments, graphic symbols and notations in landscape designing.
- 7. Functional uses of plants in the landscape.
- 8. 9. Designing gardens using Auto-CAD/ Archi-CAD.
- 10. Study and designing of different styles of gardens.
- 11. Study and designing of gardens based on different themes.
- 12. Layout of recreational and children's corner, terrarium.
- 13. Designing gardens for specific places.
- 14. Visit to public/ institutional / botanical gardens

Bachelor of Vocation (B. Voc.) Part III - Sem. V Skill Enhancement Courses (SEC– E-IV) Paper Title: Nutrition of Horticultural Crops and its Management Practical IV Course no. BVHSTCC125

Paper No:	Credits: 02
Term Work: 2 lectures/week	Total Marks: 50(Internal)

Course Outcomes: The students will acquire knowledge of

1. Acquire the knowledge of Preparation of various fertilizers.

2. Acquire the knowledge of processing of fertilizers.

3. Acquire the knowledge of Secondary and micronutrient fertilizers.

- 1. Sampling of organic manures and fertilizers for chemical analysis.
- 2. Physical properties of manures and fertilizers.
- 3. Quick tests for identification of important fertilizers.
- 4. Detection of adulteration in fertilizers.
- 5. Estimation of ammonical nitrogen in ammonical fertilizers (Ammonium sulphate).
- 6. Estimation of nitrate nitrogen and ammonical nitrogent (Ammonium nitrate).
- 7. Estimation of total nitrogen Urea.
- 8. Estimation of Total nitrogen in Farm Yard manure.
- 9. Estimation of water soluble P2O5 in SSP.
- 10. Estimation of Potassium in MOP/SOP.
- 11. Estimation of Zinc in Zinc sulphate.
- 12. Determination of Calcium in SSP or Lime.
- 13. Visit to fertilizer testing laboratory.
- 14. Visit to Vermicomposting unit.

B. Voc. Part-III Semester –VI Hortipreneurship development and Business Management-IV(AECC-F)

Course no. BVHSTCS126	
Paper No:	Credits: 04
Theory: 4 lectures/week	Total Marks: 50 (Theory 40 + Internal 10)
Course outcome: The students will acquire know	wledge of
i). Skill oriented course useful for mark	eting and entrepreneurship
ii). Course is framed for overall person	ality development of the students.
iii). To develop leadership qualities through	bugh organization of various events.

Modules Prescribed for Theory: Module I:

15 Entrepreneur : Meaning, definitions, characteristics of entrepreneurship, Assessment of entrepreneurship skills, identifying potential entrepreneurs Entrepreneurship development-Concept of entrepreneurship, Process of entrepreneurship development, Achievement motivation and entrepreneurship development. Generation, incubation and commercialization of business ideas and innovations. 15

Module II:

SWOT analysis: Concept and technique

Government schemes and incentives for promotion of entrepreneurship. Government policy on Small and Medium Enterprises (SMEs/SSIs)

15

15

15

Supply chain management, Time management and Total quality management

Module III:

Market Survey : Meaning, objectives, methods of conducting survey Formulation of project, financial analysis of project

Overview of horti input industry chracteristikcs of Indian horticultural processing and export

industry. Business Communication

Module IV:

Communication – Meaning and process of communication

Communication skills for entrepreneurship – Written communication, Verbal communication, Investigating and analyzing, Planning and Organizing, Negotiating and persuading, Cooperative (Team work), Leadership and Numeracy

Developing different skills for entrepreneurship - Leadership, Speaking, Listening Skills, Organizational, Managerial and Problem solving skill,

Writing Skill – Business letter, letters of enquiry, quotation, orders, and tenders, complaint Letter. Oral presentation skills - Preparation, presentation and evaluation

Advertisements – Meaning, types, forms, functions.

Practicals Based on theory

ReferenceBooks:

- 1. Akhouri, M.M.P., Mishra, S.P. and Sengupta, Rita (1989). Trainers Manual on
- 2. Developing Entrepreneurial Motivation, NIESBUD, New Delhi
- 3. Betty, Gorddan B. (1979). Entrepreneurship, Playing to Win, Taraporewala, Mumbai
- 4. Entrepreneurship Development Institute in India (1987). Developing New Entrepreneurs, EDII, Ahmedabad, NISIET, Library: 338.93/EDI/87/25104.
- 5. Mancuso, Joseph (1974). The Entrepreneurs Handbook, Vol.I & II, Artech House Inc.USA. e-reading:http://ecourses.iasri.res.in/

Bachelor of Vocation (B. Voc.) Part II - Sem. VI (Degree) Generic Elective Compulsory Course (GEC–F) Paper Title: Post harvesting management of Horticulture product Course no. BVHSTEC127

Paper No: Theory: 4 lectures/week Practical: 2 lectures/week/batch	Credits: 04 Total Marks: 50 (Theory 40 + Internal 10)
Course Outcomes: The students will acquire knowledge of	
 Acquire the knowledge about postharvest technologies. Acquire the knowledge about deterioration, ha Acquire the knowledge about quality parameter. 	nology rdening ers.
Module I	15
Importance of postharvest technology in horticultural cro Maturity, types and factors affecting maturity of horticult Maturity indices, harvesting, handling, grading of fruits, v	ps. ural crops. vegetables, cut flowers,
plantation crops, medicinal and aromatic plants.	15
Nodule II Pre-harvest factors affecting quality, factors responsible f produce. Hardening and delaying ripening process	For deterioration of horticultural
Physiological and biochemical changes.	
Module III	14
Postharvest treatments of horticultural crops.	
Quality parameters and specification of horticultural prod	luce.
Structure of fruits, vegetables and cut flowers related to p	hysical changes after harvest.
Module IV	16
Methods of storage for local market and export.	
Pre-harvest treatment, pre-cooling and pre-storage treatm Different systems of storage, packaging methods and ty packaging. Types of containers and cushioning materia and poly shrink packaging, grape guard packing treatmen	ents. pes of packages, recent advances in ls, vacuum packaging, cold storage, nts. Modes of transport.
 References: 1.Battacharjee, S. K. and De, L. C. 2005. Post Harvest Tech OrnamentalsPlants. Ponteer Publisher, Jaipur, India. 2. Chadha, K. L. and Kalloo, G.1993. Advances in Horticu 3. Fellows, P. J. 1998. Food Processing Technology – prin 4. Hulme, A.C. 1970. Food Science & Technology - A Ser of Fruits and their Products. Vol1. Academic Press Lop 5. Jacob John, P. 2008. A Handbook on Post Harvest manag DavaPublishing House. Delhi-1081-7035-532-X 	nology of Flowers and Ilture. Vol. 4 to 10. MPH, New Delhi. ciples and Practices. Ellis Horwood. ries of Monograph. The Biochemistry ndon & New York. gement of Fruits and vegetables.

6. e-reading: http://ecourses.iasri.res.in/

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Discipline Specific Core Course (DSC–F-I) Paper Title: Food Beverages Course no. BVHSTCC 128

Paper No:	Credits: 04
Theory: 4 lectures/week	Total Marks: 50 (Theory)
Course Outcomes: The students will acquire knowledge of	
 Acquire the knowledge about importance of beverages Acquire the knowledge about processing of beverages Acquire the knowledge about various beverages 	
Module I	15
History and importance of beverages and status of beverage industry. Processing of beverages.	
Packaged drinking water, juice based beverages.	
Module II	15
Synthetic, still, carbonated, low-calorie and dry beverages, isotonicand sports drinks, dairy based and alcoholic beverages.	
Fruit beverages, speciality beverages, tea, coffee, cocoa, spices, plantextracts.	
FSSAI specifications for beverages.	
Module III	15
Ingredients, manufacturing and packaging processes and equipmentfor different beverages.	
Water treatment and quality of water for beverage industry.	
Sweeteners, colorants, acidulants, clouding, clarifying and flavouring agents f beverages	or
Module IV	15
Carbon dioxide and carbonation.	
Quality tests and control in beverages.	
Miscellaneous beverages: coconut water, sweet toddy, sugar cane juice,	coconut milk,flavoured syrups.
References:	
 Fruit and Vegetable Juices by Tressler D.K., Joslyn M.A. andMarsh G.C. AV NewYork 1971 	/I publishing company

- 2. Food and Beverage Technology International USA by Bernard and Alan, Sterling Publication, 1989.
- 3.Beverages: Technology, Chemistry and Mcirobiology, Varnam and Sutherland, Springer, 1994.
- 4. Food Flavourings, P.R. Ashust, Springer, 2012.
- 5. Handbook of Alcoholic, Beverages Alan Buglass, John Wiley and Sons, 2011
- 6. Preservation of Fruit and VegetableProducts, Girdharilal, Siddappa, Tondon, Indian Council of

Agricultural Research, Publications 1986

7. e-reading: http://ecourses.jasri.res.jn/

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Discipline Specific Core Course (DSC– F-II) Paper Title: Processing of Horticulture Product Course no. BVHSTCC 129

Paper No: Theory: 4 lectures/week	Credits: 04 Total Marks: 50 (Theory)
Course Outcomes: The students will acquire knowledge of	
1. Acquire the knowledge about production and processing of fru 2. Acquire the knowledge about blanching operations and equipm 3. Acquire the knowledge about preparation and preservation of i	its and vegetables. nent.
Module I	15
Production and processing scenario of fruits and vegetables in India and V	World.
Scope of fruit and vegetable preservation industry in India. Present status Principles of preservation methods of fruits and vegetables.	constraints and prospects.
Module II	15
Commercial processing technology of fruits and vegetables	10
Primary processing and packaging house, handling of fruits and vegetables. Peeling, slicing, cubing, cutting and other size reduction operations for vegetables.	les; fruitsand
Modulo III	15
Blanching operations and equipment of Horticulture Product	15
Canning: Definition, processing steps, and equipment, cans and contain assurance and defects in canned products.	ers, quality
Preparation and preservation of juices, squashes, syrups, sherbets, nectar Problems on squash and RTS; Processing and equipment for above prod specification	rs and cordials. ucts and FSSAI
Module IV	15
Working and applications of machines used for manufacture of crystalliz preserves; jam, jelly marmalades andcandies.	zed fruitsand
Working and applications of machines used for manufacture of preserve	, concentrate,
fruit wine, sauerkraut, chutney, pickles, sauce, puree, paste, ketchup;tof	fee, cheese, lather,
dehydrated wafers and papads, soup powders; FSSAI specification.	
Production of pectin and vinegar; Commercial processing technology of	selectedfruits
and vegetables for production of various value added processed products	5.
 References: Fruit and Vegetable Preservation Principles and Practices Srivastava F International Book DistributingCompany, New Delhi 2005 Post Harvest Technology of Fruits and Vegetables : Handling, Proces and Waste Management vol. I & II Varma L. R. andJoshi V.K. Indus Preservation of Fruits and Vegetables G. Lal, G.S. Siddappa, G.L.Tar Publication, New Delhi1996. Fruit and Vegetable ,Processing M.G. Danthy FAO, Rome. Post harvest Handling and Processing of Fruit and Vegetable I.S. Sing 6. Fruit Processing, David Arthey 	R.P.and SanjeevKumar sing, Fermentation Publishing, 2000 adan ICAR
/. e-reading. http://ecourses.nasti.res.ill/	

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Discipline Specific Core Course (DSC– F-III) Paper Title: Fundamentals of Entomology, Pest of Fruit, Vegetable and Flower Course no. BVHSTCC 130

Paper No: Theory: 4 lectures/week	Credits: 04 Total Marks: 50 (Theory)
Course Outcomes: The students will acquire knowledge of 1.Acquire the knowledge about Horticultural Entomology. 2.Acquire the knowledge about integrated management of inse 3.Acquire the knowledge about ecology and insect-pest management	ct pests. ement
Module I Introduction and History of Entomology in India including contribution brief.	10 n of scientistsin
 Entomology: Definition and scope. Horticultural Entomology: Insect pest of fruits, vegetables and flowers Module II Economic importance of pests in vegetable ornamental plants, etiology management. Important pests of ornamental crops. 	and pest
Pest surveillance in important ornamental crops. Module III Ecology and insect-pest management with reference to fruits. Distribution, host range, bio-ecology, injury, integrated management of	10 f important insect
pests affecting tropical, sub-tropical and temperate fruits- citrus, mange pomegranate, guava and banana. Integrated management of important insect pests attackingunder storag Module IV	o, grapevine, e fruits.
Distribution, host range, bio-ecology, injury, integrated management of affecting vegetable. Pests of processed vegetables their host range, bio-ecology, injury and management.	f important pests integrated
Pest surveillance in important vegetable. References:	
1. Ayyar, T.V.R. 1963, Hand Book of Economics Entomology for South Madras.	India. Govt. Press
2. David, B.V. 2006. Elements of Economic Entomology. Popular Book I	Depot, Chennai.
 Butani, D.K. and M.G.Jotwani, 1984. Insects of Vegetables. Periodical New Delhi. 	Expert Book Agency,
 Srivastava, K.P. and D.K.Butani, 1998. Pest Management in Vegetable Periodicals and Book Publishing House, India. 113 	es (Part I & II) Research

e-reading: http://ecourses.iasri.res.in/

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Skill Enhancement Courses (SEC– F-I) Paper Title: Post harvesting management of Horticulture product Practical I Course no. BVHSTEC127

Paper No:	Credits: 02
Practical: 4 lectures/week	Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

1.Acquire the knowledge about postharvest technology 2.Acquire the knowledge about deterioration, hardening 3.Acquire the knowledge about quality parameters.

Practical

- 1. Maturity indices of fruits.
- 2. Maturity indices of vegetables.
- 3. Maturity indices of flowers.
- 4. Maturity indices of Spices.
- 5. Determination of physiological loss in weight and quality.
- 6. Grading of horticultural produce manual and Mechanical.
- 7. Post-harvest treatment of horticultural crops, physical and chemical methods.
- 8. Packaging in fruits, vegetables by using different packaging materials.
- 9. Packaging in plantation crops and cut flowers by using different packaging materials.

10. Methods of storage.

- 11. Post-harvest disorders in horticultural produce.
- 12. Visit to packaging houses, cold storage.
- 13. Project/Field visit/ Internship/ Field work /Hands on training

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Skill Enhancement Courses (SEC– F-II) Paper Title: Food Beverages Practical II Course no. BVHSTCC 128

Paper No: Practical: 4 lectures/week Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

Acquire the knowledge about importance of beverages
 Acquire the knowledge about processing of beverages
 Acquire the knowledge about various beverages

Practical

1. Quality analysis of water from different sources and treatments.

2.Determination of aqueous extraction of tea/coffee.

3. Test for chicory in coffee.

4. Detection of sodium benzoate in beverage.

5.Measurement of pH and acidity of beverage.

6.Detection of E. coli in beverage.

7.Measurement of CO₂ content of carbonated beverage.

8.Determination of caffeine in beverages.

9.Determination of tannins in wine.

10.Preparation of RTS beverage.

11. Preparation of carbonated beverage.

12. Specifications for different fruit beverages and preparation of fruits squash.

13.Preparation of artificial lemon juice.

14. Visit to carbonation unit.

15. Visit to mineral water plant .Project/Field visit/ Internship/ Field work /Hands on training

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Skill Enhancement Courses (SEC– F-III) Paper Title: Processing of Horticulture Product Practical III Course no. BVHSTCC 129

Paper No: Practical: 4 lectures/week Credits: 02 Total Marks: 50 (Practical)

Course Outcomes: The students will acquire knowledge of

1. Acquire the knowledge about production and processing of fruits and vegetables.

- 2. Acquire the knowledge about blanching operations and equipment.
- 3. Acquire the knowledge about preparation and preservation of juices.

- 1. Primary processing of selected fruits and vegetables.
- 2. Canning of mango/guava/ papaya.
- 3. Preparation of jam/ jelly/ marmalade from selected fruit.
- 4. Preparation of squash.
- 5. Preparation of grape raisins.
- 6. Preparation of dried fig / banana fig.
- 7. Preparation of fruit candy.
- 8. Osmotic dehydration of fruit slices.
- 9. Preparation of fruit toffee.
- 10. Preparation of dried onion/garlic/ginger.
- 11. Preparation of banana/ potato wafers.
- 12. Preparation of dehydrated tomato powder.
- 13. Visit to fruits and vegetables processing unit.
- 14. Project/Field visit/ Internship/ Field work /Hands on training.

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree) Skill Enhancement Courses (SEC– F-IV) Paper Title: Fundamentals of Entomology, pest of fruit, vegetable and flower Practical IV Course no. BVHSTCC 130

Paper No:		
Term Work: 2 lectures/week		

Credits: 02 Total Marks: 50(Internal)

Course Outcomes: The students will acquire knowledge of

1. Acquire the knowledge about Horticultural Entomology.

2. Acquire the knowledge about integrated management of insect pests.

3.Acquire the knowledge about ecology and insect-pest management

- 1. Pests of Okra and Brinjal.
- 2. Pests of Tomato, Bell pepper / Capsicum.
- 3. Pests of Cruciferous and Roost crops.
- 4. Pests of Cucurbitaceous crops.
- 5. Pests of Potato, Sweet potato.
- 7. Pests of Leafy vegetable, Pea, Beans.
- 8. Pests of Rose, Chrysanthemum, Marigold.
- 9. Pests of Jasmine, Tuberose, Aster.
- 10. Pests of Gladiolus, Gerbera, Carnation, Lily, Anthurium & Orchids
- 11. Pests of Cinnamon, Cardamom, Nutmeg.
- 12. Pests of Curry leaf, Coriander, Cumin, Fennel, Turmeric & Ginger.
- 13. Pests of Chilli, Onion and Garlic.
- 14. Insect-pests of storage & processed vegetable, ornamental and spice crops and their management.
- 15. Visit to research centre.